

WHAT IS CLAIMED IS:

1. An apparatus for implementing a media access control layer in an open system interconnection type network, comprising:

5 a plurality of operating modules each enabling a respective media access control layer operating function, wherein each of said plurality of operating modules is software – programmable for enabling said operating module to perform its associated media access control layer operating function in accordance with a plurality of communication standards;

10 a host interface module configured to enable communication between a host processor and said media access control layer;

a physical layer interface module configured to enable communication between a physical layer and said media the a access control layer; and

an inter-module communication interface enabling communication between said plurality of operating modules.

15 2. The apparatus of Claim 1, further for implementing a portion of said physical layer, including a further operating module for performing a physical layer operating function.

3. The system of Claim 2, wherein said further operating module is a software-programmable module for performing a digital signal processing function.

4. The system of Claim 3, wherein said physical layer interface is further configured to enable communication between said further operating module a remainder of said physical layer.

5. The system of Claim 1, wherein said host interface module and at least one of said operating modules are implemented together in a digital signal processor.

6. The system of Claim 1, wherein said host interface module supports a data communication protocol for enabling data frame transmission, said data communication protocol comprising:

a descriptor implemented in memory associated with said host processor for indicating frame location and size, said descriptor represents a first frame and is further linkable to an additional descriptor to form a data queue that represents a plurality of frames; and

a data buffer implemented in memory associated with said host processor for storing frame data.

7. The system of Claim 1, wherein at least one of said operating modules is implemented in a digital signal processor.

8. The system of Claim 7, wherein at least another one of said operating modules is implemented in a second processor.

5 9. The system of Claim 8, wherein said second processor is said host processor.

10. The system of Claim 1 further comprising:

a hardware accelerator for implementing at least one media access control layer operating function; and

10 said hardware accelerator coupled to said inter-module communication interface.

11. The system of Claim 1, wherein said plurality of operating modules comprises a transmitter module, receiver module, deference algorithm module, statistics maintenance module and utility module.

12. A method for implementing a media access control layer in an open system interconnection type network, comprising:

separating media access control layer operating functions into plurality of corresponding software – programmable operating modules; and

5 programming each of said operating modules to perform its corresponding media access control layer operating function in accordance with a plurality of communication standards.

13. The method of Claim 12 further comprising:

10 implementing a further media access control layer operating function in a hardware accelerator.

14. The method of Claim 12 further comprising implementing at least a portion of said operating modules together in a digital signal processor.

15. The method of Claim 14 further comprising implementing a second portion of said operating modules in a separate processor.

15 16. The method of Claim 15, wherein said separate processor is a host processor that uses said media access control layer.

17. The method of Claim 12, including providing software-based host and physical layer interface modules for enabling communication between a host processor and said media access control layer and between a physical layer and said media access control layer, respectively.

5 18. The method of Claim 17 further comprising separating said physical layer into first and second portions, wherein said first portion is implemented in a further software-programmable operating module for performing a physical layer operating function.

10 19. The method of Claim 18 further comprising implementing said further operating module and at least a portion of the remaining operating modules together in a digital signal processor.

20. The method of Claim 17 further comprising implementing said physical layer interface module in a digital signal processor together with one of said operating modules.

15 21. The method of Claim 17 further comprising implementing said host and physical layer interface modules in a digital signal processor together with one of said operating modules.

22. The method of Claim 12, including providing an inter-module programming interface enabling communication between said plurality of individual operating modules.

23. The method of Claim 22, including said host interface module maintaining in memory a plurality of descriptors for indicating frame location and size of communication data frames, and linking the descriptors to form a queue that represents a plurality of communication data frames.